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<b>CERTIFICATE OF TRANSMISSION BY FACSIMILE (37 CFR 1.8)</b>			Docket No. BUR920030108US1
Applicant(s): Badami et al.			
Application No. 10/605,885	Filing Date 11/4/2003	Examiner Nadav, Ori	Group Art Unit 2811
Invention: STRUCTURE AND PROGRAMMING OF LASER FUSE			
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<b>TRANSMITTAL OF APPEAL BRIEF (Large Entity)</b>					Docket No. <b>BUR920030108US1</b>	
In Re Application Of: <b>Badami et al.</b>						
Application No. <b>10/605,885</b>	Filing Date <b>11/4/2003</b>	Examiner <b>Nadav, Ori</b>	Customer No. <b>30449</b>	Group Art Unit <b>2811</b>	Confirmation No.	
Invention: <b>STRUCTURE AND PROGRAMMING OF LASER FUSE</b>						
<u>COMMISSIONER FOR PATENTS:</u>						
Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on <b>10/4/2005</b>						
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Khoi D. Nguyen Reg. No. 47,820 Schmeiser, Olsen & Watts 3 Lear Jet Lane, Suite 201 Latham, NY 12110 (518) 220-1850			<div style="border: 1px solid black; padding: 5px;">I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on</div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">_____ (Date)</div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">_____ Signature of Person Mailing Correspondence</div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">_____ Typed or Printed Name of Person Mailing Correspondence</div>			
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IBM DOCKET NO. BUR920030108US1

UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Badami *et al.*

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Examiner: Nadav, Ori

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Serial No.: 10/605,885

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Art Unit: 2811

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Filed: 11/04/2003

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Title: **STRUCTURE AND PROGRAMMING OF LASER FUSE**

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Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

**BRIEF OF APPELLANT**

This Appeal Brief, pursuant to the Notice of Appeal filed October 4, 2005, is an appeal from the rejection of the Examiner in the final office action dated July 6, 2005.

**REAL PARTY IN INTEREST**

International Business Machines, Inc. is the real party in interest.

**RELATED APPEALS AND INTERFERENCES**

None.

**STATUS OF CLAIMS**

Claims 1-6 and 12-17 are withdrawn. Claims 7-11 and 18-20 are rejected. Claim 8 is canceled.

#### **STATUS OF AMENDMENTS**

There are no After-Final Amendments which have not been entered.

#### **SUMMARY OF CLAIMED SUBJECT MATTER**

The present invention provides an electronic structure. The electronic structure comprises a first dielectric layer, a fuse link, and first and second mesas.

The first dielectric layer has at least first and second vias. The first and second vias are filled with a first self-passivated electrically conducting material. See specification, paragraph [0020], lines 2-6, FIG. 1.

The fuse link is on top of the first dielectric layer. The fuse link electrically connects the first and second vias and comprises a second material having a characteristic of changing its electrical resistance after being exposed to a laser beam. See specification, paragraph [0024], lines 9-11, FIG. 4.

The first and second mesas are directly above the fuse link and directly above the first and second vias, respectively. The first and second mesas each comprise a third self-passivated electrically conducting material. The fuse link is disposed between the first mesa and the first dielectric layer. The fuse link is disposed between the second mesa and the first dielectric layer. See specification, paragraph [0023], lines 8-10, FIG. 3.

The second material may comprise a substance selected from the group consisting of

TaN, TiN, and WN. See specification, paragraph [0029], lines 1-8.

The first self-passivated electrically conducting material may comprise a substance selected from the group consisting of Al and W. See specification, paragraph [0028], lines 1-10.

The third self-passivated electrically conducting material may comprise a substance selected from the group consisting of Al and W. See specification, paragraph [0030], lines 1-9.

The present invention also provides an electronic structure. The electronic structure comprises following parts.

A first dielectric layer has at least a first via and a second via both filled with a first electrically conducting material. See specification, paragraph [0032], lines 4-7, FIG. 8A.

A first oxygen-getter shield and a second oxygen-getter shield are directly above the first and second filled vias and in direct physical contact with the first electrically conducting material in the first and second vias, respectively. The first and second oxygen-getter shields comprise a second electrically conducting, oxygen-getter material. See specification, paragraph [0034], lines 1-5, FIG. 8C.

A fuse link electrically connects the first and second oxygen-getter shields. The fuse link comprises a third material having a characteristic of changing its electrical resistance after being exposed to a laser beam. The first and second regions of the first and second oxygen-getter shields, respectively, are directly above the fuse link. The fuse link is disposed between the first

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region of the first oxygen-getter shield and the first dielectric layer. The fuse link is disposed between the second region of the second oxygen-getter shield and the first dielectric layer. See specification, paragraph [0032], lines 7-10, and paragraph [0033], lines 1-3, FIG. 8D.

A first mesa and a second mesa may be directly above and in direct physical contact with the first and second oxygen-getter shields, respectively. The first oxygen-getter shield may be disposed between the first mesa and the first dielectric layer. The second oxygen-getter shield may be disposed between the second mesa and the first dielectric layer. The first and second mesas may comprise a fourth electrically conducting material. See specification, paragraph [0035], lines 1-6, FIG. 8D.

The second electrically conducting, oxygen-getter material may comprise titanium. See specification, paragraph [0034], lines 1-2, FIG. 8C.

#### **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

1. Claims 7-11 and 18-20 stand rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement.

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2. Claims 7-11 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Lee *et al.* (6,074,940) in view of Daubenspeck *et al.* (6,440,834).

3. Claims 18-20 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Daubenspeck *et al.* (6,440,834) in view of Lee *et al.* (6,074,940).

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**ARGUMENT****GROUND OF REJECTION 1**

Claims 7-11 and 18-20 stand rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement.

The Examiner rejected claims 7 allegedly because "There is no support in the disclosure and in the drawings for first and second mesas directly over the fuse link and directly over the first and second vias, as recited in claim 7." In response, Appellants have amended claim 7 and the amendment of claim 7 was entered. Appellants would like to note that "above" means being at a higher level, and that "directly above" means being at a higher level and being straight above, but not necessarily in direct physical contact. The phrase "directly above" in claim 7 can be interpreted in its plain meaning as in the real life statement "a big cloud is directly above us."

In page 2 of the Advisory Action mailed on September 23, 2005, the Examiner maintains that "directly above"...mean in direct physical contact". In response, as argued above, the Appellants maintain that the plain meaning of "directly above" does not require "direct physical contact" as stated by the Examiner.

As a result, with reference to FIG. 4 of the patent application, the first and second mesas 220a and 220b are clearly directly above the fuse link 210' and directly above the first and second vias 120a and 120b, respective. Therefore, claim 7 does not fail to comply with the written description requirement under 35 U.S.C. 112, first paragraph.

The Examiner rejected claim 8 under 35 U.S.C. 112, first paragraph. Appellants canceled

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claim 8. Therefore, the issue is moot.

The Examiner rejected claims 18 allegedly because "There is no support in the disclosure and in the drawings for first and second regions of the first and second oxygen-getter shields being directly over the fuse link, such that the fuse link is disposed between the first and second regions of the first and second oxygen-getter shields and the first dielectric layer, as recited in claim 18." In response, similar to the case of claim 7, Appellants amended claim 18. Again, Appellants would like to note that "above" means being at a higher level, and that "directly above" means being at a higher level and being straight above, but not necessarily in direct physical contact.

As a result, with reference to FIG. 8L of the patent application, the first oxygen-getter shield 825a comprises the first region (at top right) which is directly above the fuse link 810'. Similarly, the second oxygen-getter shield 825b comprises the second region (at top left) which is directly above the fuse link 810'. In other words, the first and second regions of the first and second oxygen-getter shields 825a and 825b are directly above the fuse link 810'. Therefore, claim 18 does not fail to comply with the written description requirement.

Based on the preceding arguments, Appellants contend that claims 7, 9-11 and 18-20 do not fail to comply with the written description requirement under 35 U.S.C. 112, first paragraph.

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**GROUND OF REJECTION 2**

Claims 7-11 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Lee *et al.* (6,074,940) in view of Daubenspeck *et al.* (6,440,834).

Appellants respectfully contend that claim 7 is not unpatentable over Lee in view of Daubenspeck, because Lee in view of Daubenspeck does not teach or suggest each and every feature of claim 7. For example, Lee in view of Daubenspeck does not teach or suggest the feature “the fuse link *electrically connecting* the first and second vias” of claim 7 (*italic emphasis added*).

Although Daubenspeck teaches in figure 1f and related text a fuse link 26 electrically connecting the first and second vias 16, there is no motivation or incentive to electrically connect the two vias 20 of Lee (FIG. 2A). In fact, Lee even teaches away electrically connecting the two vias 20 (FIG. 2A) with the fuse link 40. More specifically, with reference to FIG. 2D of Lee, gaps 41 are created so as to electrically disconnect the fuse link 40 from the two vias 20 (column 2, lines 2-8). Then, in FIG. 2E of Lee, an oxide (a dielectric material) layer 35 is formed to ensure the electrical isolation between the fuse link 40 and the two vias 20 (column 2, lines 8-9). In other words, Lee teaches away electrically connecting the two vias 20 with the fuse link 40.

Based on the preceding arguments, Appellants respectfully maintain that claim 7 is not unpatentable over Lee in view of Daubenspeck, and that claim 7 is in condition for allowance.

In page 2 of the Advisory Action mailed on September 23, 2005, the Examiner argued that FIG. 2A of Lee teaches that the fuse link of claim 7 *indirectly* electrically connects the first

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and second vias of claim 7 because "A complete device (circuit) which comprises interconnects and a fuse link must have currents flowing through the entire circuit, including both the interconnects and the fuse link" (bold emphasis added). The Appellants agree with the Examiner that, in FIG. 2A of Lee, there must be an electrical path such that currents can flow through the fuse link 40. However, as can be seen in both FIGs. 1 and 2A of Lee, such an electrical path does not go through the two vias 20. In other words, contrary to the Examiner's arguments, the fuse link 40 neither directly **nor indirectly** electrically connects the two vias 20 (bold emphasis added). Therefore, Lee in view of Daubenspeck does not teach the feature "the fuse link electrically connecting the first and second vias" of claim 7.

The Examiner rejected claim 8 under 35 U.S.C. §103(a). However, Appellants have canceled claim 8, therefore, the issue is moot.

The Examiner also rejected claim 9-11 under 35 U.S.C. §103(a). Since claims 9-11 depend from claim 7, which is in condition for allowance as argued above, Appellants contend that claims 9-11 are likewise in condition for allowance.

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**GROUND OF REJECTION 3**

Claims 18-20 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Daubenspeck *et al.* (6,440,834) in view of Lee *et al.* (6,074,940).

Appellants respectfully contend that claim 18 is not unpatentable over Daubenspeck in view of Lee, because Daubenspeck in view of Lee does not teach or suggest each and every feature of claim 18. For example, Daubenspeck in view of Lee does not teach or suggest the feature “*first and second regions of the first and second oxygen-getter shields, respectively, are directly above the fuse link*” of claim 18 (italic emphasis added).

In Daubenspeck, FIG. 1(f), no portion of the first and second oxygen-getter shields 20a and 20b is directly above the fuse link 26. In Lee, in FIG. 2A, contrary to the Examiner’s statement, no portion of the first and second oxygen-getter shields 30 (which are directly above the two vias 20) is directly above fuse link 40. There are two regions 30 directly above the fuse link 40. However, these two regions 30 are not directly above the two vias 20 and therefore cannot be considered the first and second oxygen-getter shields for the purpose of rejecting claim 18. As a result, Daubenspeck in view of Lee does not teach or suggest the feature “*first and second regions of the first and second oxygen-getter shields, respectively, are directly above the fuse link*” of claim 18 (italic emphasis added).

The Examiner alleged that the fuse link in Daubenspeck, FIG. 1(f), may be longer in some applications and therefore would result in “first and second regions of the first and second oxygen-getter shields being directly over the fuse link.” Appellants respectfully disagree. In

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Daubenspeck, FIG. 1(f), even if the fuse link 26 is extended longer, the fuse link 26 would push the first and second oxygen-getter shields 20a and 20b farther apart, and still no portion of the first and second oxygen-getter shields 20a and 20b would be directly above the fuse link 26 as claimed in claim 18. This is so because the fuse link 26 is formed aligned with the first and second oxygen-getter shields 20a and 20b (FIGs. 1(d)-1(c)). This is contrary to the Examiner's statement that "longer fuse would result first and second regions of the first and second oxygen-getter shields being directly over the fuse link."

Based on the preceding arguments, Appellants respectfully maintain that claim 18 is not unpatentable over Daubenspeck in view of Lee, and that claim 18 is in condition for allowance.

The Examiner rejected claim 19. Since claim 19 depends from claim 18, Appellants contend that claim 19 is likewise in condition for allowance.

Moreover, the Examiner rejected claim 19 allegedly because "prior art's device comprising *a first mesa and a second mesa 20a, 20b* being directly over and in direct physical contact with the first and second oxygen-getter shields, respectively" (*italic emphasis added*). In response, Appellants respectfully note that earlier the Examiner used regions 20a and 20b of Daubenspeck (FIG. 1f) to teach and suggest the first and second oxygen-getter shields of claim 18. Now, the Examiner uses the same regions 20a and 20b of Daubenspeck (FIG. 1f) to teach and suggest the first and second mesas of claim 19. Because the regions 20a and 20b of Daubenspeck cannot represent both the first and second oxygen-getter shields of claim 18 and the first and second mesas of claim 19, Appellants contend that the Examiner's argument is not

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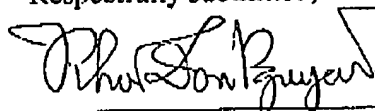
persuasive and that claim 19 is in condition for allowance.

The Examiner rejected claim 20. Since claim 20 depends from claim 18, Appellants contend that claim 20 is likewise in condition for allowance.

### SUMMARY

In summary, Appellant respectfully requests reversal of the July 6, 2005 Office Action rejection of claims 7-11 and 18-20.

Respectfully submitted,

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Applicants: Badami *et al.*

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Examiner: Nadav, Ori

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Filed: 11/04/2003

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Title: **STRUCTURE AND PROGRAMMING OF LASER FUSE**

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**APPENDIX A - CLAIMS ON APPEAL**

7. An electronic structure, comprising:

a first dielectric layer having at least first and second vias filled with a first self-passivated electrically conducting material;

a fuse link on top of the first dielectric layer, the fuse link electrically connecting the first and second vias and comprising a second material having a characteristic of changing its electrical resistance after being exposed to a laser beam; and

first and second mesas directly above the fuse link and directly above the first and second vias, respectively, the first and second mesas each comprising a third self-passivated electrically conducting material, wherein the fuse link is disposed between the first mesa and the first dielectric layer, and wherein the fuse link is disposed between the second mesa and the first dielectric layer.

9. The electronic structure of claim 7, wherein the second material comprises a substance selected from the group consisting of TaN, TiN, and WN.

10. The electronic structure of claim 7, wherein the first self-passivated electrically conducting material comprises a substance selected from the group consisting of Al and W.

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11. The electronic structure of claim 7, wherein the third self-passivated electrically conducting material comprises a substance selected from the group consisting of Al and W.

18. An electronic structure, comprising:

a first dielectric layer having at least a first via and a second via both filled with a first electrically conducting material;

a first oxygen-getter shield and a second oxygen-getter shield being directly above the first and second filled vias and in direct physical contact with the first electrically conducting material in the first and second vias, respectively, the first and second oxygen-getter shields comprising a second electrically conducting, oxygen-getter material; and

a fuse link electrically connecting the first and second oxygen-getter shields, the fuse link comprising a third material having a characteristic of changing its electrical resistance after being exposed to a laser beam, wherein first and second regions of the first and second oxygen-getter shields, respectively, are directly above the fuse link, such that the fuse link is disposed between the first region of the first oxygen-getter shield and the first dielectric layer, and such that the fuse link is disposed between the second region of the second oxygen-getter shield and the first dielectric layer.

19. The electronic structure of claim 18, further comprising a first mesa and a second mesa being directly above and in direct physical contact with the first and second oxygen-getter shields,

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respectively, such that the first oxygen-getter shield is disposed between the first mesa and the first dielectric layer and such that the second oxygen-getter shield is disposed between the second mesa and the first dielectric layer, the first and second mesas comprising a fourth electrically conducting material.

20. The electronic structure of claim 18, wherein the second electrically conducting, oxygen-getter material comprises titanium.

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Title: **STRUCTURE AND PROGRAMMING OF LASER FUSE**

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**APPENDIX B - EVIDENCE**

There is no evidence entered by the Examiner and relied upon by Appellant in this appeal.

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	)	
Title: STRUCTURE AND PROGRAMMING OF LASER FUSE		

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APPENDIX C - RELATED PROCEEDINGS

There are no proceedings identified in the "Related Appeals and Interferences" section.

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